

Unit Planning Guide: Grade Unit 5 of 8

Unit Title: Right Triangles and Trigonometry	Pacing (Duration of Unit): 20 days
Grade: Geometry	Buffer Day(s): 5 days

Desired Results

Transfer Goals

Students will be able to independently use their learning to:

- **Make sense of problems and persevere in solving them.**
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- **Model with mathematics.**
- **Use appropriate tools strategically.**
- **Attend to precision.**
- Look for and make use of structure.
- **Look for and express regularity in repeated reasoning.**

Established Goals (2011 MA Curriculum Frameworks Standards Incorporating the Common Core State Standards)

Pre-Requisite Standards:

- **8.G.6-** Explain a proof of the Pythagorean Theorem and its converse.
- **8.G.7-** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and mathematical problems in two and three dimensions.
- **8.G.8-** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Standards (Priority Standards in bold):

- **G-SRT.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.**
- **G-SRT.7 Explain and use the relationship between the sine and cosine of complementary angles.**
- **G-SRT. 8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. «**
- G-SRT. 9 (+) Derive the formula $A = \frac{1}{2}ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.
- G-SRT.10. (+) Prove the Laws of Sines and Cosines and use them to solve problems.
- G-SRT.11. (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

(+) indicates standard beyond College and Career Ready

WIDA for English Language Learners

Standard 1: ELLs **communicate** for **Social** and **Instructional** purposes within the school setting
Standard 3: ELLs **communicate** information, ideas and concepts necessary for academic success in the content area of **Mathematics**

In the lesson planning stage, teachers will need to differentiate lessons for ELLs. In order to accomplish this they will need: 1.) this curriculum map, 2.) a list of their ELLs and their proficiency levels, and 3.) appropriate language function expectations and scaffolds or supports.

Meaning (*Mostly assessed through Performance Tasks/Assessments)

Big Ideas:

- Use special relationships in right triangles.
- Extend the use of the Pythagorean Theorem and its converse.
- Use the trigonometric ratios to solve right triangles.

Essential Questions:

- In what ways do tradesmen employ the Pythagorean Theorem?

Acquisition (*Mostly assessed through traditional summative assessments)

Knowledge:

Students will know ...

- definitions of the parts of a right triangle (**leg, hypotenuse, right angle**).
- that special right triangles (30-60-90 and 45-45-90) have relationships between the legs and hypotenuse.
- that side ratios in a right triangle lead to the definitions of trigonometric ratios (by similarity).
- definitions of trigonometric ratios (**sine, cosine, tangent**).
- the relationship between sine and cosine of complementary angles.
- (+)understand the Law of Sines and Law of Cosines.

(+) indicates standard beyond College and Career Ready

Bolded words are key academic vocabulary

Skills:

Students will be skilled at:

- computing the missing lengths of a leg and/or hypotenuse of a right triangle (*Application*)
- solving right triangle problems using Pythagorean Theorem and/or Trig ratios (*Application*)
- applying 30-60-90 and 45-45-90 right triangle rules to finding the unknown measures (*Application*)
- devising the rules for 30-60-90 and 45-45-90 right triangles using patterns and examples of triangles (*Synthesis*)
- explaining the relationship between sine and cosine of complementary angles (*Comprehension*)
- (+) applying the Law of Sines and Law of Cosines to find unknown measurements (*Evaluation*)
- (+) deriving the formula $A = \frac{1}{2}ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side. (*Synthesis*)

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Chapter 7
7.1/7.2 Briefly
7.3
7.4
7.5/7.6
7.7